Qualitas.

Overview of ongoing projects at Qualitas AG

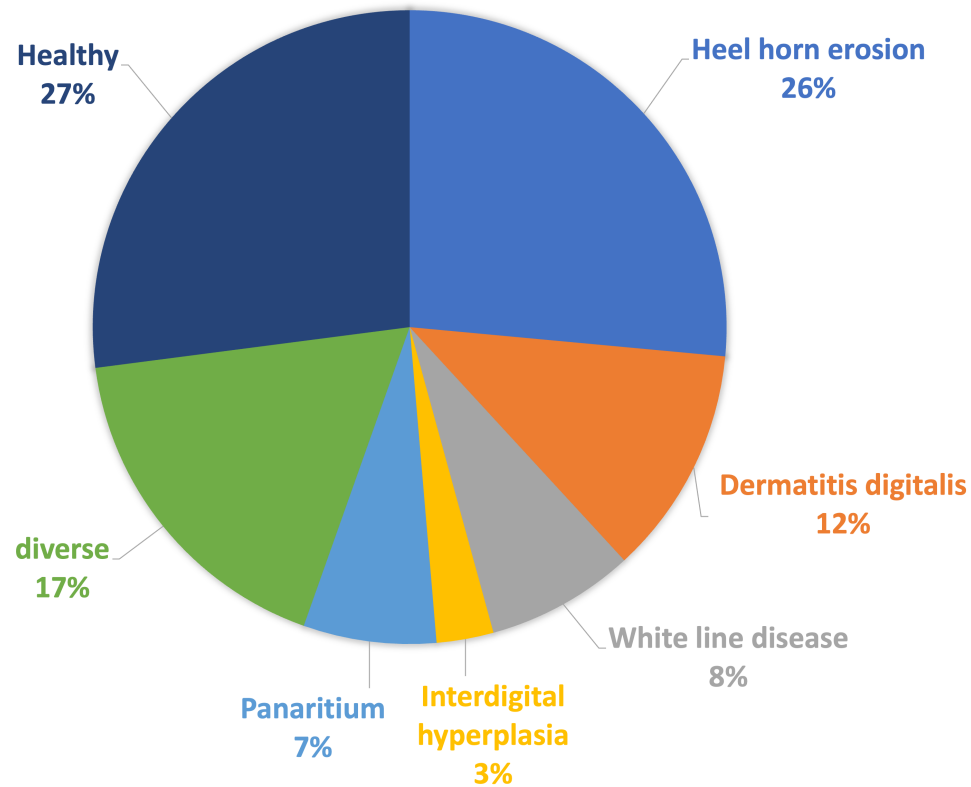Adrien Butty

Some current projects at Qualitas

- Claw health breeding value estimation
- Development of single-step method
- Implementation of new index for beef breeds
- Methane Project
- Others

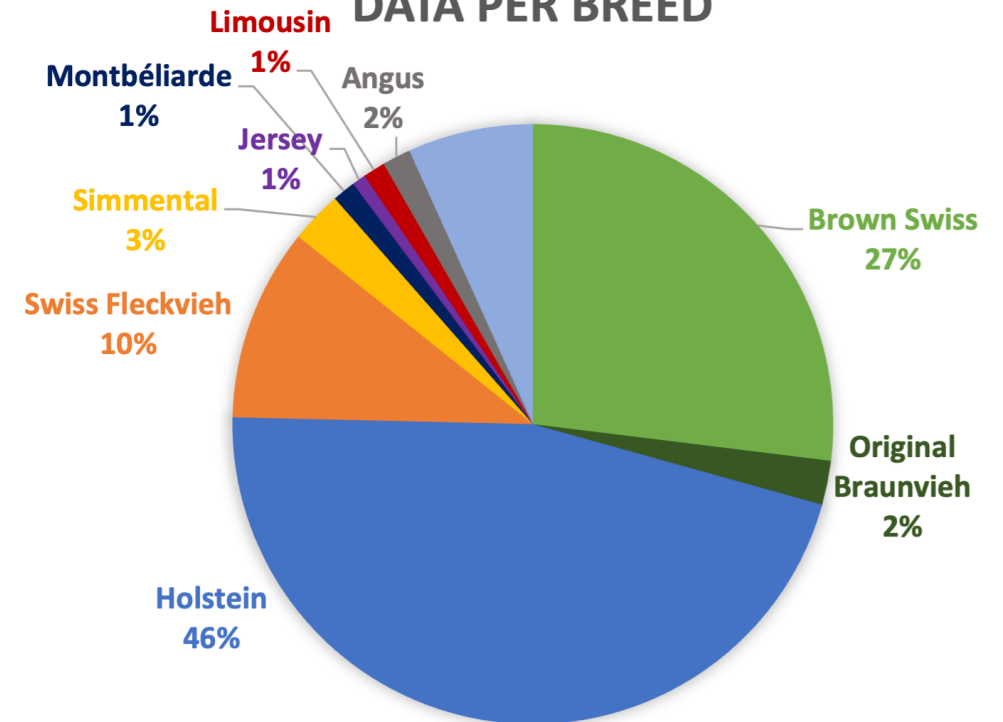# Breeding value estimation of claw health

- **Aim** to develop and introduce breeding value estimation for claw health traits
- **Involved** Sarah Widmer and the team of the project Gesunde Klauen (https://www.gesundeklauen.unibe.ch/)
- Index including single diseases and disease groups weighted by economic value
- Model considers occurrence of the disease / disease group per lactation

Data overview

DATA PER ANIMAL AND DAY

- Healthy 27%
- Heel horn erosion 26%
- Dermatitis digitalis 12%
- White line disease 8%
- Interdigital hyperplasia 3%
- Panaritium 7%
- diverse 17%

DATA PER BREED

- Limousin 1%
- Montbéliarde 1%
- Angus 2%
- Jersey 1%
- Simmental 3%
- Brown Swiss 27%
- Swiss Fleckvieh 10%
- Original Braunvieh 2%
- Holstein 46%
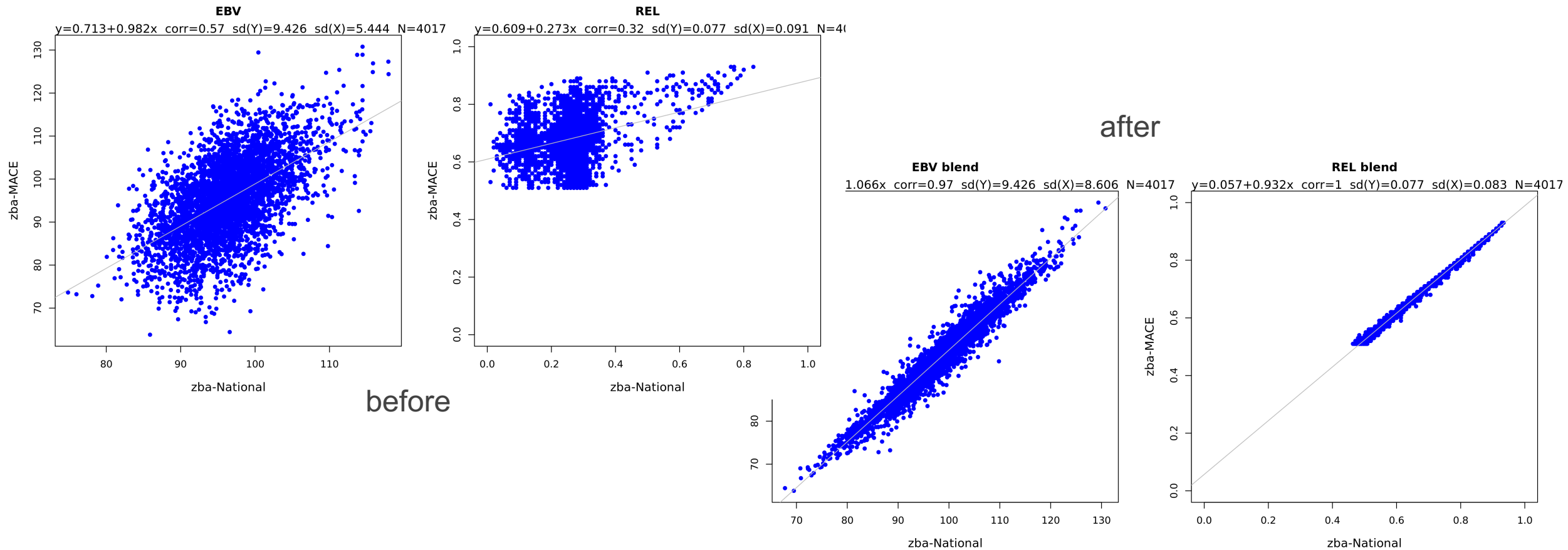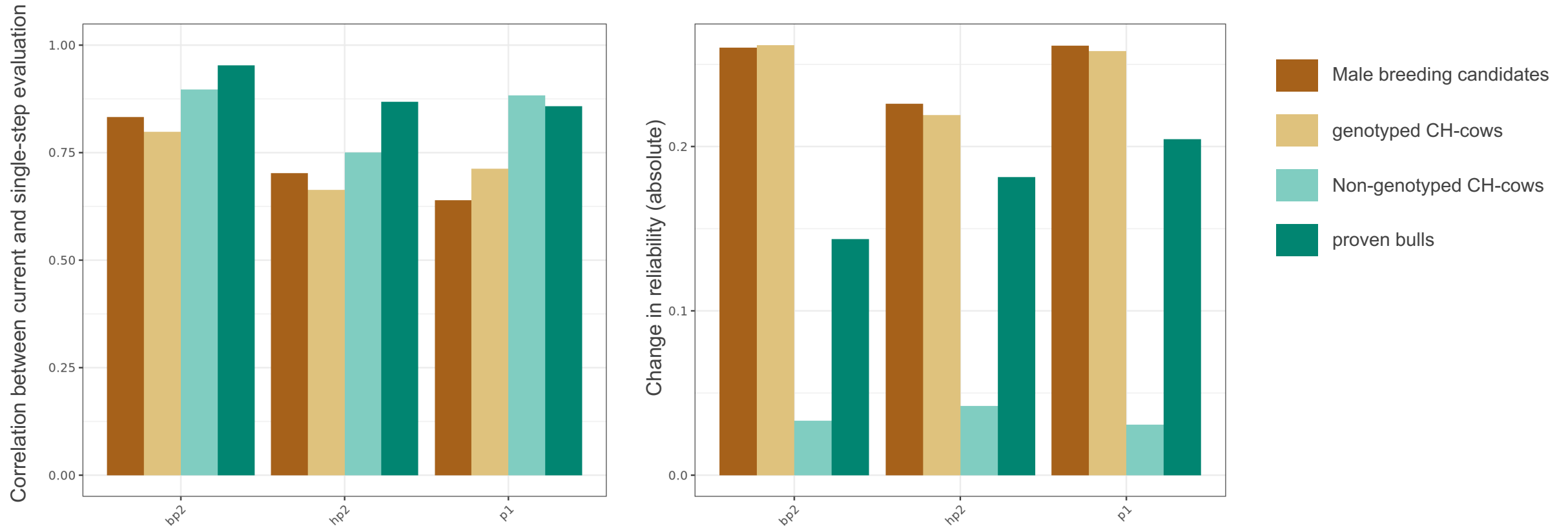
Development of single-step genomic evaluation

- **Aim** to replace the current multi-step genomic evaluation for all breed-trait combinations
- **Involved** Madeleine Berweger, Adrien Butty, Hadi Esfandyari, Urs Schnyder, Mirjam Spengeler, Patrick Stratz, Peter von Rohr, Sarah Widmer
- Presentation on single-step methods and very first results was hold at the SABRE-TP workshop of 2020
- ssGTaBLUP-method using MiX99 (Luke)
  - Research collaboration with Luke to gain knowledge from the team and access to latest development of software
- Current multibreed analysis will be kept

Integration of international information

EBV
y=0.713+0.982x corr=0.57 sd(Y)=9.426 sd(X)=5.444 N=4017

REL
y=0.609+0.273x corr=0.32 sd(Y)=0.077 sd(X)=0.091 N=4(

EBV blend
1.066x corr=0.97 sd(Y)=9.426 sd(X)=8.606 N=4017

REL blend
y=0.057+0.932x corr=1 sd(Y)=0.077 sd(X)=0.083 N=4017

before

after

Qualitas

Publication of first single-step EBV in April 2024: calf survival

Implementation of new index for beef breeds

- **Aim** to develop and introduce breeding value indexes for beef breeds based on <u>bio-economic</u> model

- **Involved** Sophie Kunz, Peter von Rohr
  - Jessica Gearing until January 2023

- Weight for indexes calculated following the ECOWEIGHT method (Wolfova et al., 2005)

- Various production systems (suckler, dual, beef-on-dairy), marketing channels, breeds considered

Three indexes should be introduced

First publication in April 2024

Beef-on-Beef
For beef cattle breeders with suckler beef herds

«Meat index»
for breeders who have dual purpose breeds (Simmental and Original Brown Swiss), that are interested in carcass traits

Beef-on-Dairy
For dairy cattle breeders who wants to produce calf they can sell better for meat production

Beef-on-Dairy
for beef cattle breeders who wants to sell bulls to be used by dairy cattle breeders

Methane Project

- **Aim** to establish a routine BV evaluation for reduced methane relying on Swiss methane data

- **Involved** Beat Bapst, Adrien Butty and the ASR

- The development will first build up on the evaluation for reduced methane setup by Lactanet

- So far only methane data for cattle in Switzerland come from experiment, at the ETH or Agroscope

- Overall strategy in 3 steps:

Methanstrategie Rindviehzucht Schweiz (ASR)

Schritte	Datenflüsse	Arbeitspakete	Arbeitsbeteiligung				Finanzierung		
			QAG	ASR	Lactanet	Dritte	QAG	ASR u. Dritte	BLW
Schritt 1: Routine ZWS für HOL		ZWS CH4 mit Phänotypenvorhersage über MIR Daten	✓	✓	✓		✓	✓	
Schritt 2: F&E mit CH Phänotypen und Integration BSW		AP5: Zuchtprogramm	✓	✓			✓	✓	
		AP4: Integration CH BSW Daten in CH4 ZWS	✓	✓			✓	✓	✓
		AP3: Integration CH HOL Daten in CH4 ZWS	✓	✓			✓	✓	
		AP2: Daten-Pipeline	✓				✓	✓	
		AP1: CH4 Phänotypisierung	✓	✓		✓	✓	✓	✓
		AP0: Projektmanagement	✓	✓			✓	✓	✓
Schritt 3: Vernetzung		Kanadisches Projekt mit Fokus auf Methan	✓		✓	✓	(✓)	(✓)	
		Zukünftig zu definierende Projekte z.B. mit Agroscope, ETHZ	✓	✓		✓	(✓)	(✓)	

Projekt CH$_4$COW

CH$_4$COW: Five main work packages

Package	Content
Phenotyping in CH	Installation of 60 Sniffers on CH Farms. Most in automatic milking system. Computation of CH$_4$ in g/day
Data-Pipeline	Develop routine processes for data exchange between farms and Qualitas as well as between Qualitas and Lactanet
Integration of CH HOL-Data in BV estimation	Add the Swiss CH$_4$ Phenotypes for Holstein to the Canadian evaluation
Integration of CH BSW Data in BV estimation	Develop a BV estimation model for Brown Swiss breed with Swiss CH$_4$ Phenotypes
Implementation into CH breeding program	Analyse options to include CH$_4$ EBV into Swiss breeding programs and their effect on genetic gain

Other projects in short

- Update of BV estimation model for calving traits from sire-grand-sire to animal model

- Update of our low density genotyping array

- Different work on heat tolerance and resilience BV estimation models

- Implementation of genomic selection (two-steps methods) for the Swiss Angus population

- Further projects mentioned in other talks today…

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